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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,616	03/25/2004	Yutaka Ochi	KYO.P0029	7254
<div>7590 05/04/2007</div> RENNER, KENNER, GREIVE, BOBAK, TAYLOR & WEBER Fourth Floor First National Tower Akron, OH 44308-1456			<div>EXAMINER</div> SITTA, GRANT	
			<div>ART UNIT</div> 2609	<div>PAPER NUMBER</div>
			<div>MAIL DATE</div> 05/04/2007	<div>DELIVERY MODE</div> PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/809,616

Applicant(s)

OCHI, YUTAKA

Examiner

Grant D. Sitta

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/12/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Drawings***

1. Figures 1A, 1B and 1C should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, in claim 13:

the subfields of the first subfield group being dispersed into the second and third subfield groups, the subfields of the second subfield group and the subfields of the first subfield group dispersed into the second subfield group consisting of a former half of the subfield sequence in order of displaying the image, the subfields of the third subfield group and the subfields of the first subfield group dispersed into the third subfield group consisting of a latter half of the subfield sequence in order of displaying the image, a total of the display periods in the former half of the subfield sequence and a total of the display periods in the latter half of the subfield sequence being almost equal to each other.

The drawings do not show where the previous subfield groups are dispersed into the latter subfield groups. Every feature must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 6 , 9 and 13-18 are rejected under 35 USC 112.
5. Claims 6 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. "when the second subfield is

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turned on at a certain gradation level, the second subfield is continuously turned on at gradation levels higher than the certain gradation level.” (Claim 6, the last line) (Claim 9, lines 2-4) and elsewhere. It is unclear how the second subfield can be turned on at a certain gradation level and a higher than certain gradation level.

6. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear which half of the subfield sequence the second subfield group is to consist of. It is also unclear how the second and third subfield groups can be dispersed into their own respective groups. “[t]he subfields of the first subfield group being dispersed into the second and third subfield groups, the subfields of the second subfield group and the subfields of the first subfield group dispersed into the second subfield group consisting of a former half of the subfield sequence in order of displaying the image, the subfields of the third subfield group and the subfields of the first subfield group dispersed into the third subfield group consisting of a latter half of the subfield sequence in order of displaying the image, a total of the display periods in the former half of the subfield sequence and a total of the display periods in the latter half of the subfield sequence being almost equal to each other.” (claim 13 line 6 from the bottom)

7. Claim 16 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter

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which applicant regards as the invention. Claim 16 is rejected for the same reasons as claim 13. It is unclear how the subfields are dispersed.

8. Claims 14-15 and claims 17-18 are rejected for depending on rejected claims 13 and 16.

9. Claim 13 recites the limitation "the first display period" in claim 13 line 11 from the bottom. There is insufficient antecedent basis for this limitation in the claim.

Claim Objections

10. Claim 1 is objected to because of the following informalities: "an image being to be displayed on the display unit when the subfields are selectively turn on" (claim 1, line 8). Examiner notes grammatical errors "subfields are selectively turn on" was "subfields are selectively turned on" meant? Examiner also notes similar mistakes throughout the claims and appropriate correction should be done where required. Appropriate correction is required.

11. Claim 13 objected to because of the following informalities: "subfield group have second display..." should be "subfield group have a second display" (claim 13, 12 lines from the bottom. Also, "the third subfield group have third display periods..." should be "the third subfield group have a third display periods..." (claim 13, lines 10 from the bottom). Examiner also notes similar mistakes throughout the claims and appropriate correction should be done where required. Appropriate correction is required.

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Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Tajima et al (US 6,249,265) hereinafter Tajima.

14. In regards to claim 1,

a display (fig 51, (30)) unit having a matrix of multiple pixels(fig. (51)

intersection of D1 and Y1, D2 and Y2, D2 and Y3, etc.);

a divider (fig. 1 (73)) to divide a field of a digital input video signal to be supplied to the display unit into a specific number of subfields (col. 16, lines 60-70 “a sub-frame forming means”);

a memory storing (col. 27 lines 30-37, “storage means”) a look-up table (fig. 16) to be used by the divider for dividing the field into the subfields, the look-up table listing data for selectively turn on and off (col. 27, lines 30-37, “a table, as shown in Fig. 16 through 23 or in Fig 28 and 29, in which it is specified which sub-frames are to be turn-on or left off for each gray-scale display level...”) the subfields in accordance with gradation levels ((col. 27 lines 30-37, “display level”) of the digital video signal, an image being to be displayed on the display

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(col. 18, lines 40-52, "one or more sub-frames to be sustained discharged in accordance with the gray-scale level to be displayed") unit when the subfields are selectively turn on (col. 18, lines 40-52, "selecting and turning on one or more sub-frames selected for sustained discharge"); and

a driver (Fig. 7 and 51 (31)) to drive the pixels of the display (fig 51, (30)) unit per specific number of subfields so that an image based on the digital input video (col. 3, lines 34-44, "...receiving externally applied inputs...") signal is displayed on the display unit (col. 3, lines 45-50, "being selected in sequence to display one frame of the image.") Examiner notes that col. 37 lines 55-65 the layout in fig. 7 are the same as those in 51,

wherein the specific number of subfields are aligned in the look-up table in order of displaying the image (col. 34 lines 20-25, "FIGS. 37 and 38 are tables for indicating sequences of sub-frames during which a cell is lit") display periods of the subfields become longer or shorter in order of displaying the image (fig. 55 col. 41, lines 20-45 "Thus, the glow cycle or an interval between sub-frames during which a cell is lit becomes shorter") a difference in display period between subfields becomes smaller per one subfield or per several number of the subfields as the display periods become longer. (col. 5 lines 27-35) "Therefore, the adjustment of the gray-scale display levels of intensity is done by appropriately selecting sub-frame patterns from a number of sub-frame patterns set to given weights in terms of number of sustained discharges for each sub-frame.") Examiner notes that the display period and the weight of the sub-frames within the frame have the same effect. Higher weighted sub-frames will have

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higher numbers of sustained discharges, according to Tajima. While Applicant's sub-frames that have longer display periods will be displayed for a longer time period.

15. In regards to claim 2, The display apparatus according to claim 1, in the look-up table (fig. 20), a specific subfield to be turned on (fig. (20) "Circles indicate turned on sub-frames") is shifted from a first subfield having the shortest display period towards a second subfield having the longest display period among the subfields, as the gradation level becomes higher, and when the second subfield is turned on at a certain gradation level, the second subfield is continuously turned on at gradation levels higher than the certain gradation level (Fig 20). Examiner notes, when the gradation, or gray scale levels, becomes higher the second sub-frame will be higher than the previous gradation levels. In Fig. 20 the "Weighted Arrangement of sub-frames within a frame" are not in numerical order, however, when the gray scale levels increase the "Weighted Arrangement of sub-frames within a frame" increase accordingly.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claim 3,4, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima in view of Otobe et al (6,144,364) hereinafter Otobe.

4. In regards to claim 3, Tajima teaches all the limitations of claim 1.

Tajima fails to teach, wherein the specific number of subfields are aligned in the look-up table in order of displaying the image, display periods of the subfields become longer or shorter in order of displaying the image, a difference in display period between subfields is constant over the subfields.

However, Otobe teaches a light emission time and determines a luminance level, comprising the steps of setting the sustain times of each of the sub fields approximately constant within 1 field, and displaying image data on the display using N+1 gradation levels(col. 5-6, lines 55-10).

It would have been obvious to one of ordinary skill in the art to modify Tajima to include the use of a constant display period between subfields as taught by Otobe in order to effectively prevent the generation of pseudo contour and the generation of flicker and thus realize a high quality image on a plasma tv or the like (col. 5-6, lines 55-10).

5. In regards to claim 4, see claim 2.

6. In regards to claim 5, wherein the specific number of subfields is divided into a first subfield group (Oto be fig. 61 (sf(3), sf(4), sf(5) etc.) "Light emission time") and a second subfield group (Oto be fig. 61 sf(3), sf(4), sf(5), etc. "

Address Display time") aligned in the look-up table (fig.62) in order of displaying the image (Fig. 62 Luminance 0,1,2,3,4,etc)., first subfields in the first subfield group (Oto be fig. 61 (sf(3), sf(4), sf(5) etc.) "Light emission time") have display periods that become longer or shorter in order of displaying the image whereas second subfields in the second subfield group (Oto be fig. 61 sf(3), , sf(4), sf(5), etc. " Address Display time") have a display period constant over the second subfields (fig. (61), "setting the sustain times of each of the sub fields approximately constant within 1 field...". Col. 5-6 lines 60-5).

7. In regards to claim 6, in the look-up table (Oto be fig. 75), a specific subfield to be turned on (Oto be,fig. 75) is shifted from a first subfield (fig 74, (sf1)), having the shortest display period towards a second subfield (fig. 74 (sf8)) having the longest display period over the first (fig. 74 ("address display times")) and second subfield groups(fig. 74 "light emission time"), as the gradation level becomes higher (fig. 75), and when the second subfield is turned on at a certain gradation level, the second subfield is continuously turned on at gradation levels higher than the certain gradation level (col. 46, lines 50-70 and col. 34, lines 30-70)

8. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima as applied in claim 1 and further in view of Hirakawa et al (6,097,358) hereinafter, Hirakawa.

9. In regards to claim 7, Tajima teaches all the limitations of claim 1.

Tajima fails to teach dividing into three groups with varying display periods according to the group.

However, Hirakawa teaches a specific number of subfields is divided (fig. 3) into a first subfield group (fig. 3, SFG3), a second subfield group (fig. 3, SFG2), and a third subfield group (fig. 3, SFG1), aligned in the look-up table (fig. 1 84 (sub-field memory) in order of displaying the image (fig. 1 (1)), first subfields in the first subfield group have display periods (fig. 3, SFG3 "36"), that become shorter in order of displaying the image, second subfields in the second subfield group have display periods shorter than the display periods of the first subfields (fig. 3, SFG2 "6"), and third subfields in the third subfield group have display periods that become longer in order of displaying the image (fig. 3, SFG1 "1"), (col. 7-8, lines 53-30).

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify Tajima to include the use of separate subfield groups that become shorter and longer according to the group as taught by Hirakawa in order to "realize a stable operation for producing gradation display regardless of gradation levels to be reproduced in the case of performing a smaller number of addressings than the number of sub-fields grouped into some groups." as stated in (col. 3, lines 40-45 of Hirakawa).

10. In regards to claim 8, wherein the display periods (Hirakawa col. 7 line 64 "TS") of the first subfields become shorter whereas the display periods of the third subfields become longer in an inverse proportional relationship. (Hirakawa col 8, lines 1-22 "the respective weights of luminance are integer multiples of the minimum weight"). Examiner notes that even if all the groups were the same number the groups would be in a proportional relationship.

11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirakawa and Tajima as applied to claim 7 above, and further in view of Yamada et. al (6,323,880) hereinafter Yamada.

12. Hirakawa and Tajima teach all the limitations of claim 7. Hirakawa and Tajima fail to teach in the look-up table, when a specific subfield having the longest display period is turned on at a certain gradation level, the specific subfield is continuously turned on at gradation levels higher than the certain gradation level.

However, Yamada teaches a look-up table (Yamada fig. 9), when a specific subfield having the longest display period is turned on at a certain gradation level (Yamada fig. 9 "light intensity"), the specific subfield is continuously turned on at gradation levels higher than the certain gradation level. (Yamada fig 9 col. 11, lines 15-55, "With such weighting a shift up occurs...").

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify Hirakawa and Tajima to include the use of a continuously increasing gradation levels as taught by Yamada in order to provide a gray scale

display method capable of suppressing pseudo contours as stated in (col. 6, lines 10-20 of Yamada).

13. Claims 10 and 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima in view Jeong (7,057,584).

Tajima teaches all the limitations of claim 1.

Tajima fails to teach three sub groups with the first and third constant and the second group having shorter times

However, Joeng teaches subfields (fig. 3) is divided into a first subfield group (fig. 3, G1), a second subfield group (fig. 3 G2) and a third subfield group (fig. 3 G3) aligned in the look-up table (fig. 4) in order of displaying the image, first subfields in the first subfield group have a display period constant (Fig. 4 4,8,16,24,32,40) over the first subfields, second subfields in the second subfield group have display periods shorter (Fig. 4 1,2) than the display period of the first subfields, and third subfields in the third subfield group (Fig. 4, G3) have a display period constant over the third subfields (Fig. 4 4,8,16,24,32,40).(col. 4 lines 1-70)

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify Tajima to include the use of three sub groups with the first and third constant and the second group having shorter times as taught by Jeong in order to reduce flicker and contour noise by ensuring an adjacent configuration between sub-fields as stated in (col. 2, lines 20-25 of Jeong).

14. In regards to claim 11 wherein the display period constant over the first subfields and the display period constant over the third subfields are equal to each other (Fig. 4 4,8,16,24,32,40 for both G1 and G3 are constant).
15. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada as applied to claim 9 above, and further in view of Jeong.
16. In regards to claim 12, is rejected for the same reasons as claim 9.

Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Grant D. Sitta whose telephone number is 571-270-1542. The examiner can normally be reached on M-F 9-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amare Mengistu can be reached on 571-270-7674. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Grant D. Sitta

April 18, 2007



AMARE MENGISTU
SUPERVISORY PATENT EXAMINER